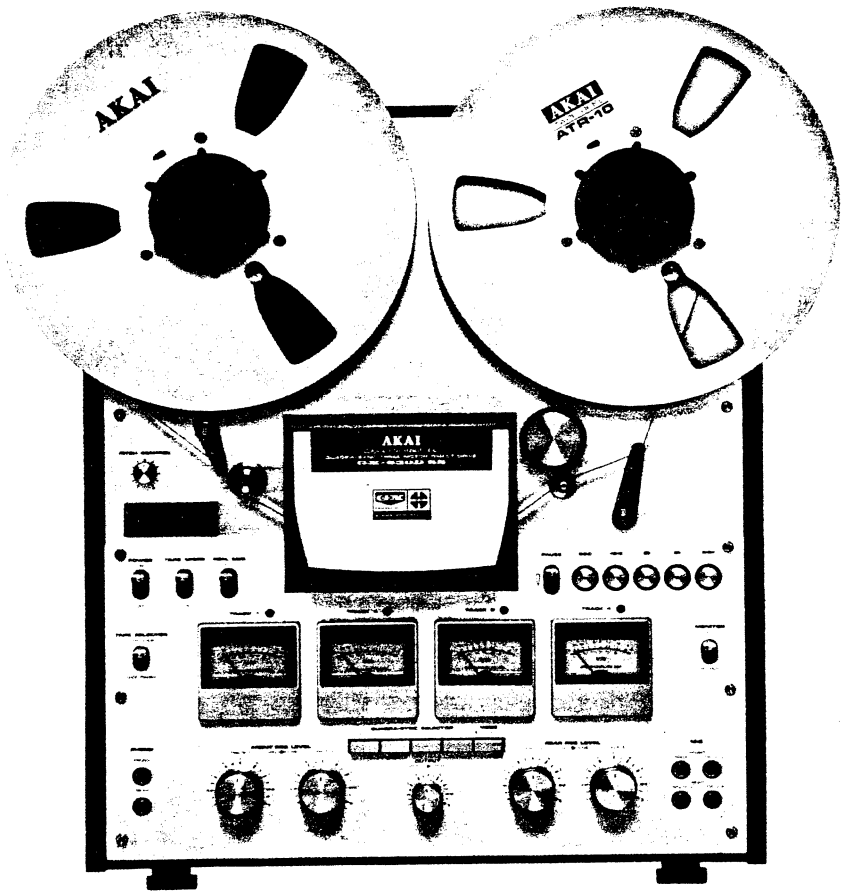
GX-630D-SS

4 CH/ 2 CH SURROUND STEREO TAPE DECK

OPERATOR'S MANUAL



WARNING:
To prevent fire or shock hazard, do not expose this appliance to rain or moisture.

AKAI

MANUFACTURED & DISTRIBUTED BY AKAI ELECTRIC CO., LTD./AKAI TRADING CO., LTD./AKAI AMERICA LTD.

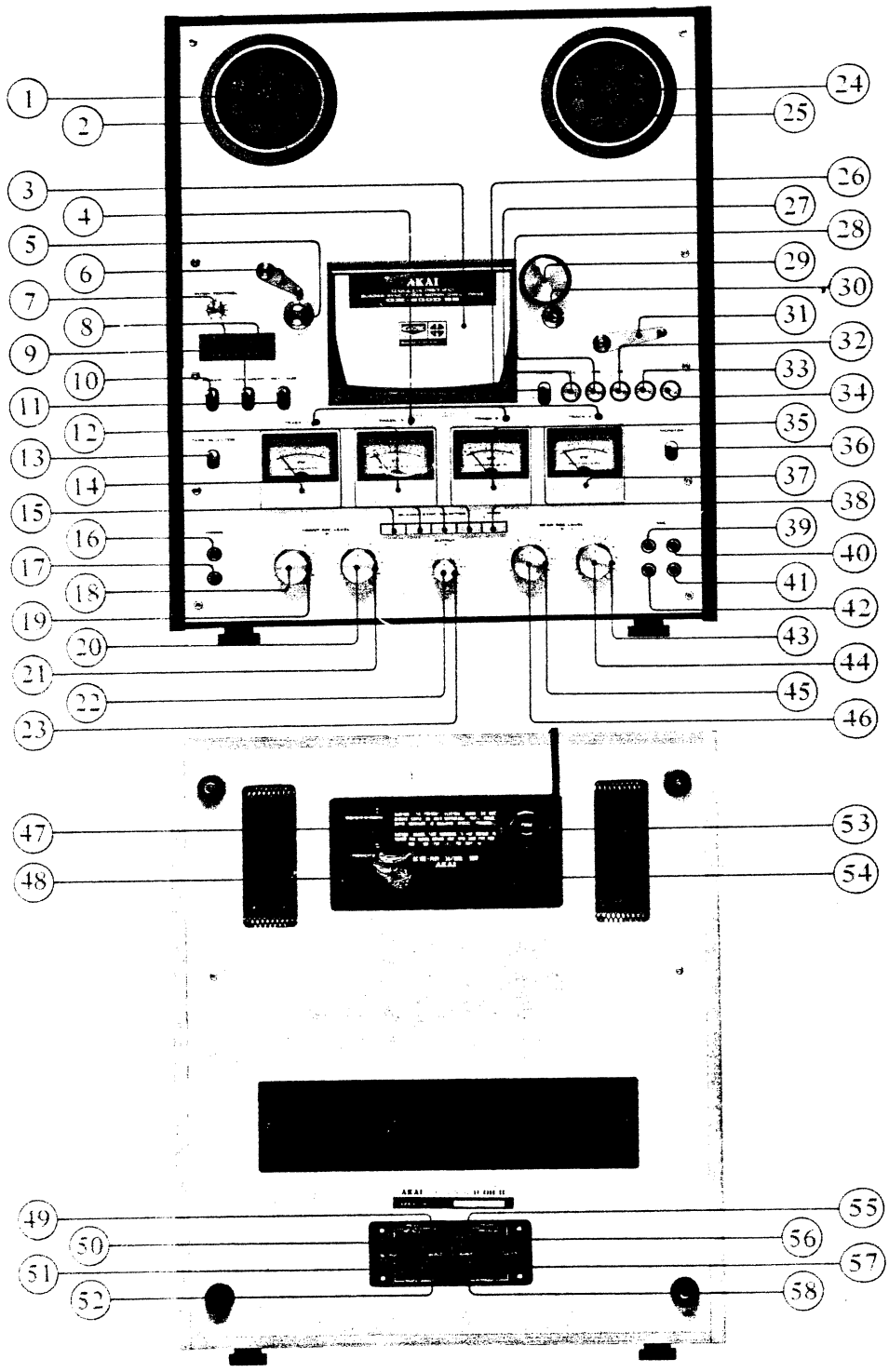
CEE, CSA, BSI, and UL and LA Standard models are not equipped with a Voltage Selector and Cycle Change Switch. Therefore, voltage and cycle conversion is not necessary. If your machine corresponds to any of these standards, please disregard all references to voltage and cycle adjustment throughout this manual.

CEE Models: 220 V, 50 Hz.
CSA Models: 120 V, 60 Hz.
BSI Models: 240 V, 50 Hz.
UL & LA Models: 120 V, 60 Hz.

INDEX

Controls 2
Operating Precautions 4
Tape Loading 4
4-Track Recording/Playback System 5
Tape Speed Selection 5
Tape Selection 5
Automatic Stop 5
Direct Function Change Control 5
Pause Control 5
Remote Control 5
Pitch Control 5
Connections for Playback 6
Playback 7
Connections for Recording 8
Recording 9
Quadra-Sync Recording 10
Absentee Recording 11
Sound Mixing 11
Tape Erasing 11
Tape Splicing and Editing 12
Head Block Cleaning 12
Head Demagnetizing 12
Voltage and Cycle Conversion 13
Technical Data 14
Standard Accessories 14
Trouble Shooting Chart 15

CONTROLS


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58

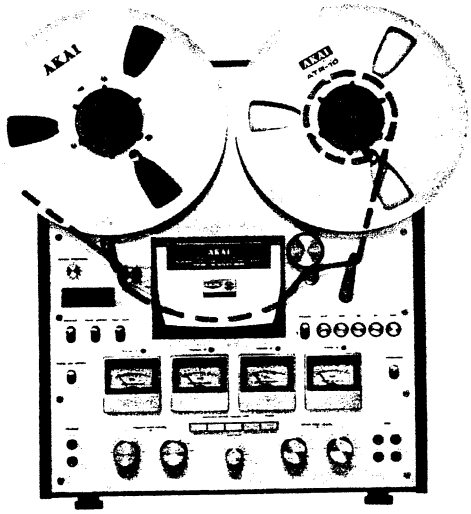
1. BUILT-IN REEL RETAINER (left)
To lock reel firmly into place, pull tip or retainer outward and turn to left or right.
2. SUPPLY REEL TABLE
3. HEAD COVER
Houses (from left) Rear-CH Erase Head, Front-CH Erase Head, 4 TR 2-CH/4-CH GX Recording Head, and 4 TR 2-CH/4-CH GX Playback Head.
4. INDIVIDUAL TRACK RECORDING INDICATOR LAMPS
Lights to indicate recording mode of each respective track.
5. IMPEDANCE ROLLER
6. TAPE TENSION LEVER
Provides ideal tape tension.
7. PITCH CONTROL
Refer to PITCH CONTROL.
* This Pitch Control must be kept at 12 o'clock position except during pitch control playback.
8. INDEX COUNTER AND RESET BUTTON
9. TAPE SPEED SELECTOR
Set to 7-1/2 or 3-3/4 ips according to desired speed.
10. POWER SWITCH
11. REEL SIZE SELECTOR
Set to "10 in" when using 10-1/2" reels and to "7 in" when using 7"or 5" reels.
** 12. TRACK 3 VU METER
Indicates Track 3 recording and playback levels.
13. TAPE SELECTOR SWITCH
WIDE RANGE: Set to this position when using Wide Range Tape.
LOW NOISE: Set to this position when using Low Noise Tape.
* Akai LN-150-7 or Scotch #211 Low Noise Tape is considered standard for this machine. The use of regular tape is not recommended.
* Set to Wide Range position only when using special wide range tape of a grade higher than low noise.
** 14. TRACK 1 VU METER
Indicates Track 1 recording and playback levels.
15. TRACK 1, 2, 3, & 4 QUADRA-SYNC SELECTOR SWITCHES
Refer to QUADRA-SYNC RECORDING, page 10.
* These switches must be kept at OFF (out position) except during Quadra-Sync recording.
16. FRONT CHANNEL HEADPHONE JACK
For front channel monitoring or headphone listening.
17. REAR CHANNEL HEADPHONE JACK
For rear channel monitoring or headphone listening. These jacks accomodate any low impedance 8 ohm type stereo headphones.
** 18. TRACK 1 MIC INPUT LEVEL CONTROL
Controls Track 1 microphone input volume. Adjust while observing Track 1 VU Meter.
** 19. TRACK 1 LINE INPUT LEVEL CONTROL
Controls Track 1 line input volume. Adjust while observing Track 1 VU Meter.
** 20. TRACK 3 MIC INPUT LEVEL CONTROL
Controls Track 3 microphone input volume. Adjust while observing Track 3 VU Meter.
** 21. TRACK 3 LINE INPUT LEVEL CONTROL
Controls Track 3 line input volume. Adjust while observing Track 3 VU Meter.
** 22. FRONT CHANNEL OUTPUT LEVEL CONTROL
Adjusts front channel output volume during playback.
23. REAR CHANNEL OUTPUT LEVEL CONTROL
Adjusts rear channel output volume during playback.
24. BUILT-IN REEL RETAINER (right)
To lock reel firmly into place, pull tip of retainer outward and turn to left or right.
25. TAKE-UP REEL TABLE
26. PAUSE SWITCH
Depress to temporarily suspend tape travel during recording or playback. Especially convenient for editing tape. Simply depress when a certain portion of the program is not desired.
* Pause Control does not function during Fast Forward or Rewind Mode.
27. RECORDING (REC) BUTTON
Depress this Button and the Play ► Button simultaneously to effect recording mode.
28. REWIND ◄◄ BUTTON
Rewinds tape at high speed.
29. PINCH WHEEL
Presses against capstan to transport tape.
30. CAPSTAN
31. AUTOMATIC STOP/TAPE TENSION LEVER
32. STOP ■ BUTTON
33. PLAY ► BUTTON
Advances tape for recording or playback mode.
34. FAST FORWARD ►► BUTTON
Advances tape at high speed.
35. TRACK 2 VU METER
Indicates Track 2 recording and playback levels.
36. TAPE MONITOR SWITCH
Set to SOURCE position to monitor source and to TAPE position for playback or private headphone listening.
37. TRACK 4 VU METER
Indicates Track 4 recording and playback levels.
38. 4CH/2CH MODE SELECTOR SWITCH
Set to OUT position for 4-CH mode, and to IN position for 2-CH mode. (only FRONT channel functions at 2-CH mode)
** 39. TRACK 1 MICROPHONE JACK
** 40. TRACK 3 MICROPHONE JACK
41. TRACK 4 MICROPHONE JACK
42. TRACK 2 MICROPHONE JACK
43. TRACK 4 LINE INPUT LEVEL CONTROL
Controls Track 4 line input volume. Adjust while observing Track 4 VU Meter.
44. TRACK 4 MIC INPUT LEVEL CONTROL
Controls Track 4 microphone input volume. Adjust while observing Track 4 VU Meter.
45. TRACK 2 LINE INPUT LEVEL CONTROL
Controls Track 2 line input volume. Adjust while observing Track 2 VU Meter.
46. TRACK 2 MIC INPUT LEVEL CONTROL
Controls Track 2 microphone input volume. Adjust while observing Track 2 VU Meter.
47. CYCLE CHANGE SWITCH (CEE, CSA, UL and LA models not equipped with this facility)
Set to 50 Hz or 60 Hz position according to area power source.
48. REMOTE CONTROL JACK
Remote control of all operating functions can be accomplished with optional accessory Remote Control Unit RC-17.
* Absentee recording can also be accomplished by using Remote Control Unit RC-17 together with a timer. (See ABSENTEE RECORDING procedure)
49. TRACK 2 LINE INPUT JACK
50. TRACK 2 LINE OUTPUT JACK
51. TRACK 4 LINE OUTPUT JACK
52. TRACK 4 LINE INPUT JACK
53. UNIVERSAL VOLTAGE SELECTOR (CEE,CSA,UL and LA models not equipped with this facility)
For voltage change, refer to VOLTAGE AND CYCLE CONVERSION procedure.
54. A.C. CORD
** 55. TRACK 1 LINE INPUT JACK
** 56. TRACK 1 LINE OUTPUT JACK
** 57. TRACK 3 LINE OUTPUT JACK
** 58. TRACK 3 LINE INPUT JACK

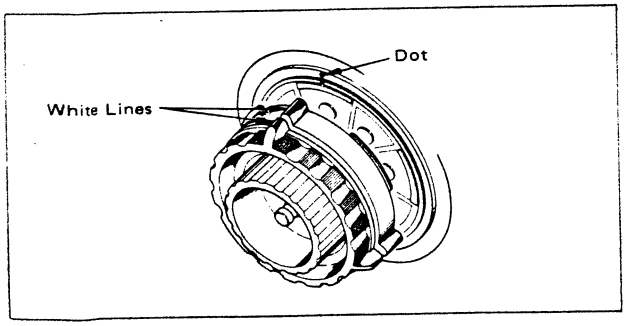
**During 2-channel operation, only the Front Channel Controls etc. function. (Track 1 Inputs, Outputs, Indicators and Controls function as the left channel, and Track 3 Inputs, Outputs, Indicators and Controls function as the right channel.)

OPERATING PRECAUTIONS

* Your machine requires constant voltage for optimum-performance. Please refer to VOLTAGE AND CYCLE CONVERSION procedure if change of voltage or cycles is necessary.
* As dirty heads and magnetized heads become the source of loss of sound, distortion, sound drop-out, and other recording and playback failures, the heads must be kept clean and demagnetized at all times.
* The Quadra-Sync Selector Switches must be at OFF (out) position except during Quadra-Sync recording.
* Place machine on a flat level surface. Operate in either vertical or horizontal position.
* Do not place anything on top of the unit which will obstruct the ventilator.
* If the sound sources are so far away from the microphones that the input level controls must be turned to maximum, some hum or noise will inevitably be recorded.
  A test recording is recommended before making a final recording.
* Use good quality tape. New tape gives best results.
* As tapes which have not been used for a period of time may have become sticky, run tape once before using.
* Always store tapes in a cool, dry place.

Should there be a problem with your machine, write down the model and serial numbers and all pertinent data regarding warranty coverage as well as a clear description of the existing trouble and contact your nearest authorized Akai Service Station or the Service Department of Akai Company, Tokyo, Japan.





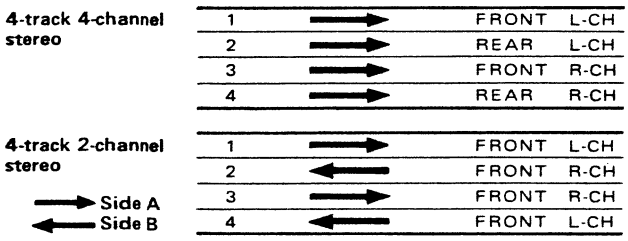
TAPE LOADING

1. Place a full reel of tape on the supply reel table and an empty reel on the take-up reel table.
2. Lock both reels into place by pulling tip of reel retainers outward and turning to left or right.
3. Unwind about an 85 cm length of tape from the supply reel and thread the tape as shown by the dotted lines in the figure.
4. Insert end of tape in slot of empty reel and wind around reel hub two or three times.
5. Continue winding tape onto take-up reel until all slack has been taken up.

When using 10½" reels, place the standard accessory reel adapter hubs on the left and right reel tables and lock into place by pulling tip of reel retainers outward and turning to left or right.

When using 10½" plastic reels
Fit hubs over reel tables so that the white lines on the inner and outer adapter hubs are aligned and match these lines with the dot on reel table.

When using 10½" metallic reels
Fit hubs over reel tables so that the white lines on the inner and outer adapter hubs are aligned, but do not match with dot on reel table. (This provides the neccessary spacing for the difference in plastic and metal reel thickness).



4-TRACK RECORDING/PLAYBACK SYSTEM

The GX-630D-SS employs a 4-track system which can be used for either 4-channel or 2-channel stereo recording and playback. Select system with front panel 2-CH/4-CH Mode Selector Switch.

4-CHANNEL STEREO RECORDING/PLAYBACK

4-channel stereo recording and playback requires the simultaneous use of all 4 tracks in one direction. Set Mode Selector to 4-CH position and use front and rear channel controls.

2-CHANNEL STEREO RECORDING/PLAYBACK

2-channel stereo recording and playback requires the simultaneous use of two tracks. Set Mode Selector to 2-CH position and use only front channel controls. The first stereo recording (playback) takes place on tracks 1 and 3 and the second on tracks 2 and 4 after the reels have been inverted.

TAPE SPEED SELECTION

This model can be operated at 7½ ips or 3¾ ips tape speed.

2-CH Stereo recording time using an 1,800 ft. tape is 3 hours at 3¾ ips and 1.5 hours at 7½ ips.

TAPE SELECTION

A Tape Selector enables the use of low noise or wide range tape.

LOW NOISE: Set to this position when using Low Noise Tape.

WIDE RANGE: Set to this position when using Wide Range Tape.

* Akai LN-150-7 or Scotch #211 Low Noise Tape is standard for this machine. The use of regular tape is not recommended.
* Set to WIDE RANGE only when using special wide range tape of a grade higher than low noise.

AUTOMATIC STOP

This model is equipped with Automatic Stop which is effected at the end of the tape, i.e., the Automatic Stop/Tape Tension Lever drops, activating the automatic stop mechanism to stop reel movement.

DIRECT FUNCTION CHANGE CONTROL

This model features feather-touch Full Direct Function Change Control. The necessity of depressing the Stop ■ Button prior to changing modes is eliminated. The inclusion of direct function change to recording mode facilitates easy add-on recording.

PAUSE CONTROL

This model is equipped with a Pause Switch for momentarily stopping tape travel during recording or playback. This feature is especially convenient for editing tape. Simply set Pause Switch in direction of the arrow when a certain portion of the program is not desired.

Return Pause Switch to normal position to resume recording.

REMOTE CONTROL

All operating functions of this model can be remote controlled by using Akai Remote Control Unit RC-17 optional accessory. Plugs into Remote Control Jack on rear panel.

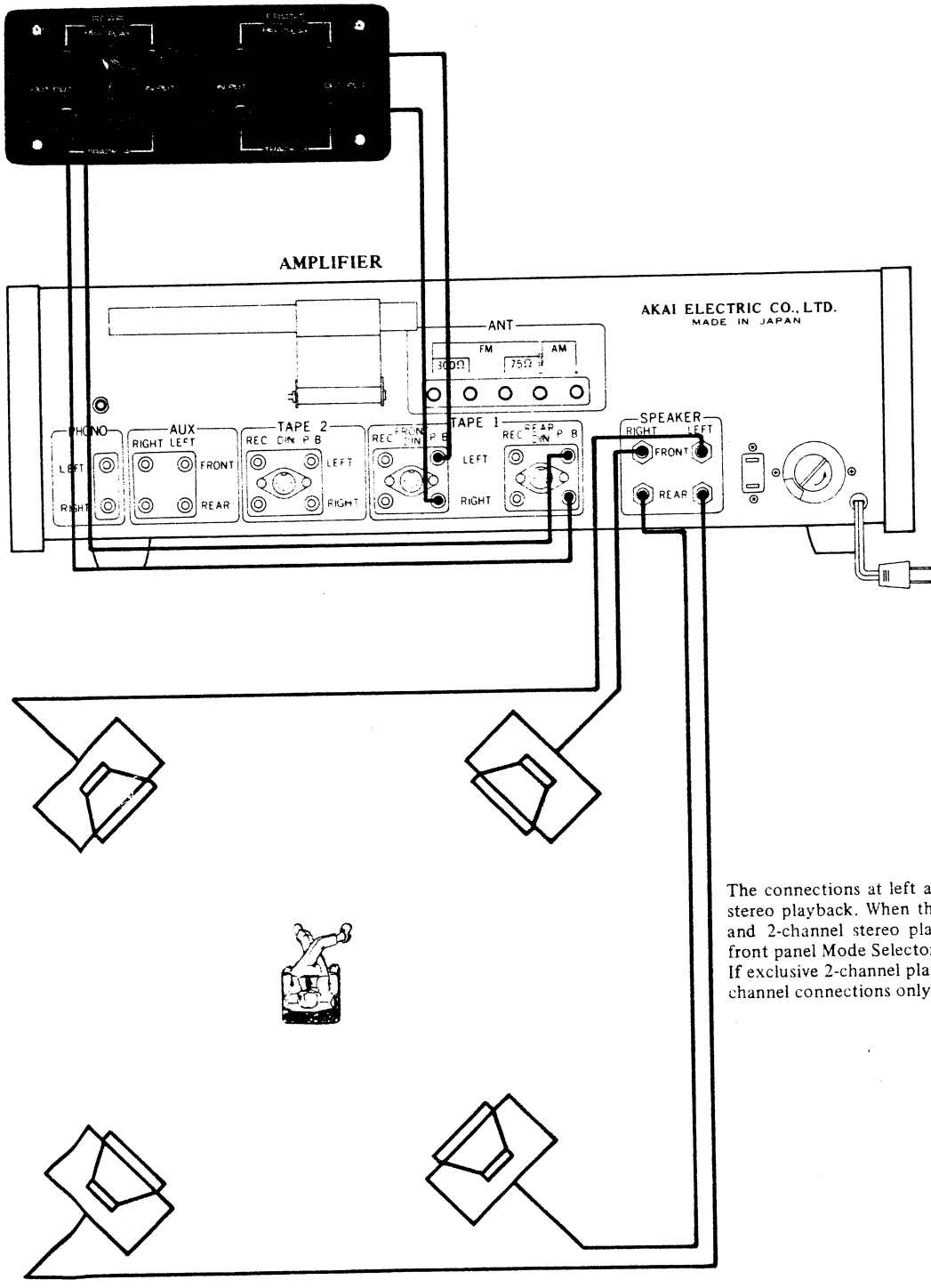
PITCH CONTROL

Employment of the Pitch Control facilitates modification of playback musical tone as desired by changing the musical interval by up to about ±1 semi-tone (tape speed ±5%).

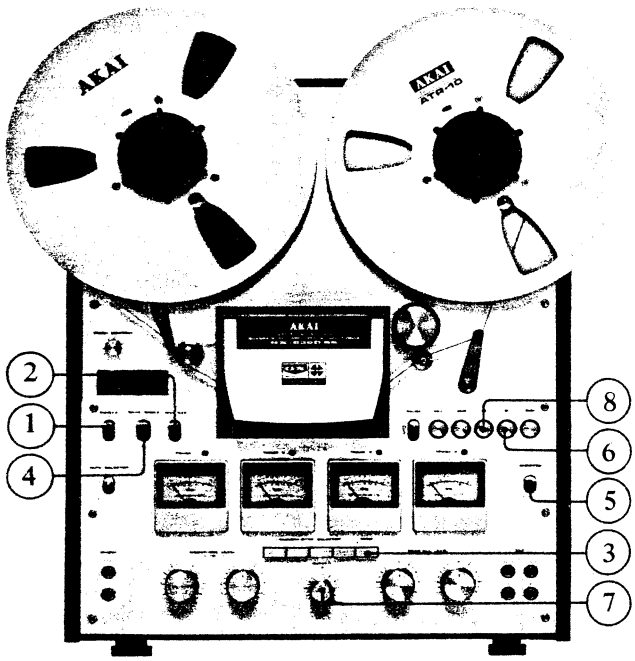
Convenient for musical instruction or adjusting pitch during duet or trio performance, etc.

* This Pitch Control is for use at playback mode only and must be kept at center (12 o'clock) position at all other times.

CONNECTIONS FOR PLAYBACK



The connections at left are for 4-channel surround stereo playback. When these connections are made and 2-channel stereo playback is desired, depress front panel Mode Selector to 2-CH position.
If exclusive 2-channel playback is desired, use front channel connections only.



PLAYBACK

4-CHANNEL PLAYBACK

Make necessary connections for 4-CH playback as shown in CONNECTIONS FOR PLAYBACK and load a 4-CH pre-recorded tape.

1. Connect power cord and turn on Power Switch.
2. Set Reel Size Selector according to size of reel being used.
3. Set Mode Selector Switch 4-CH position.
4. Select tape speed with Tape Speed Selector Switch.
5. Set Monitor Switch to TAPE position.
6. Depress PLAY ► Button to begin playback.
7. Adjust Front and Rear channel Output Level Controls and external amplifier controls.
8. Depress STOP ■ Button to stop playback.

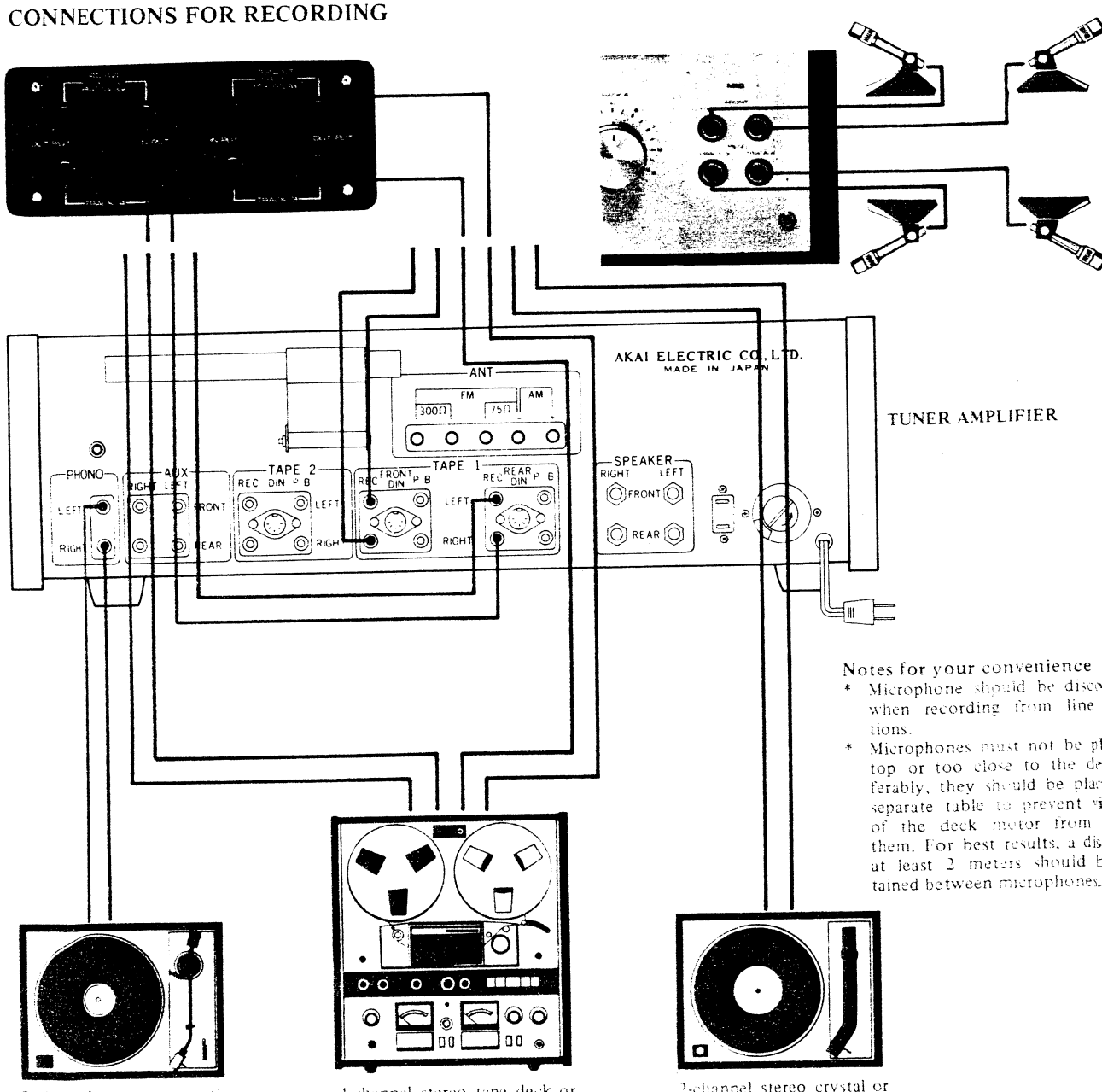
2-CHANNEL PLAYBACK

Make necessary connections for 2-CH playback as shown in CONNECTIONS FOR PLAYBACK (only front channel connections are used) and load a 2-CH pre-recorded tape.
Follow 4-CH playback procedure, substituting the following items for items (3) and (7).

3. Set Mode Selector Switch to 2-CH position.
7. Adjust Front channel Output Level Control and external amplifier controls.

* During 2-channel operation, only Front Channel Controls etc. function.
(Track 1 Inputs, Outputs, Indicators and Controls function as the left channel, and Track 3 Inputs, Outputs, Indicators and Controls function as the right channel.)

CONNECTIONS FOR RECORDING



TUNER AMPLIFIER

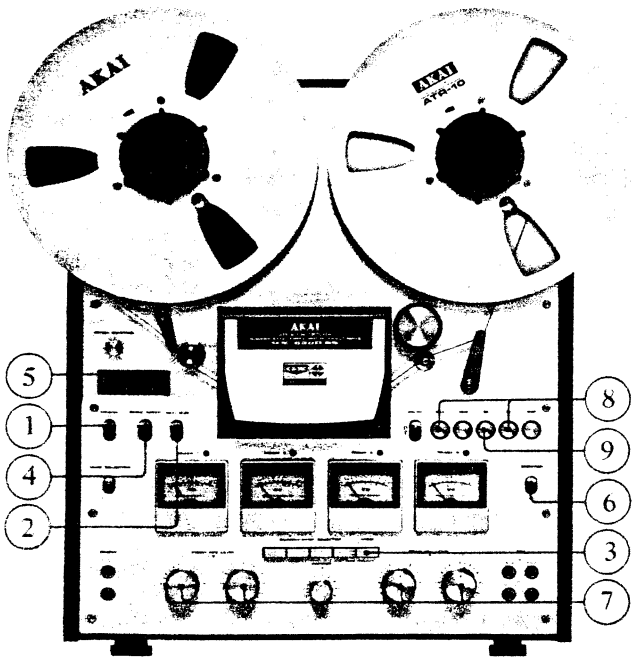
Notes for your convenience

* Microphone should be disconnected when recording from line connections.
* Microphones must not be placed on top or too close to the deck. Preferably, they should be placed on a separate table to prevent vibrations of the deck motor from reaching them. For best results, a distance of at least 2 meters should be maintained between microphones.

2-channel stereo magnetic cartridge turntable. If a 4-channel stereo magnetic cartridge turntable with built-in 4-channel playback unit is used, connect to the respective front and rear channel input jacks of the GX-630D-SS.

4-channel stereo tape deck or recorder.
When connections for 4-channel stereo recording is made and 2-channel stereo recording is desired, depress Mode Selector to 2-CH position. For exclusive 2-channel stereo recording, use front channel connections only.

2-channel stereo crystal or ceramic cartridge turntable. 2-channel stereo crystal or ceramic cartridge turntable. Connect to front channel input jacks of the GX-630D-SS.



RECORDING

4-CHANNEL RECORDING

Make necessary 4-CH program source connections as shown in CONNECTIONS FOR RECORDING, and load a tape.

1. Connect power cord and turn on Power Switch.
2. Set Reel Size Selector according to size of reel being used.
3. Set Mode Selector Switch to 4-CH position.
4. Select tape speed with Tape Speed Selector Switch.
5. With Reset Button, Set Index Counter to "0000". (This provides an easy reference for locating positions on the tape).
6. Set Monitor Switch to SOURCE position.
7. While observing the VU Meters, adjust and balance input level with Input Level Controls according to connected source. (Normal recording should not exceed "0" VU on any of the respective VU Meters).
8. When an optimum recording level has been determined, depress the REC and PLAY ► Buttons simultaneously to begin recording.
9. Depress Stop ■ Button to stop recording.

2-CHANNEL RECORDING

Make necessary 2-CH program source connections as shown in CONNECTIONS FOR RECORDING, and load a tape. (For 2-CH operation, only the Front Channel connections are used).

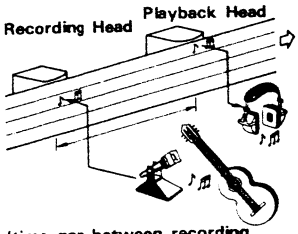
Follow 4-CH recording procedure, substituting the following steps for steps (3) and (7) and add step (10).

3. Set Mode Selector Switch to 2-CH position.
7. While observing Track 1 and Track 3 VU Meters, adjust and balance input level with Front channel Input Level Controls according to connected source.
10. Invert reels to record on Tracks 2 and 4.

* During 2-channel operation, only Front Channel Controls etc. function.
(Track 1 Inputs, Outputs, Indicators and Controls function as the left channel, and Track 3 Inputs, Outputs, Indicators and Controls function as the right channel.)

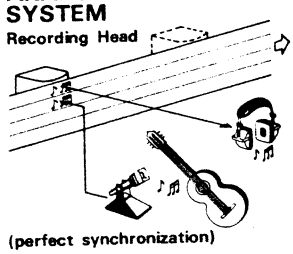
QUADRA-SYNC RECORDING

CONVENTIONAL UNIT



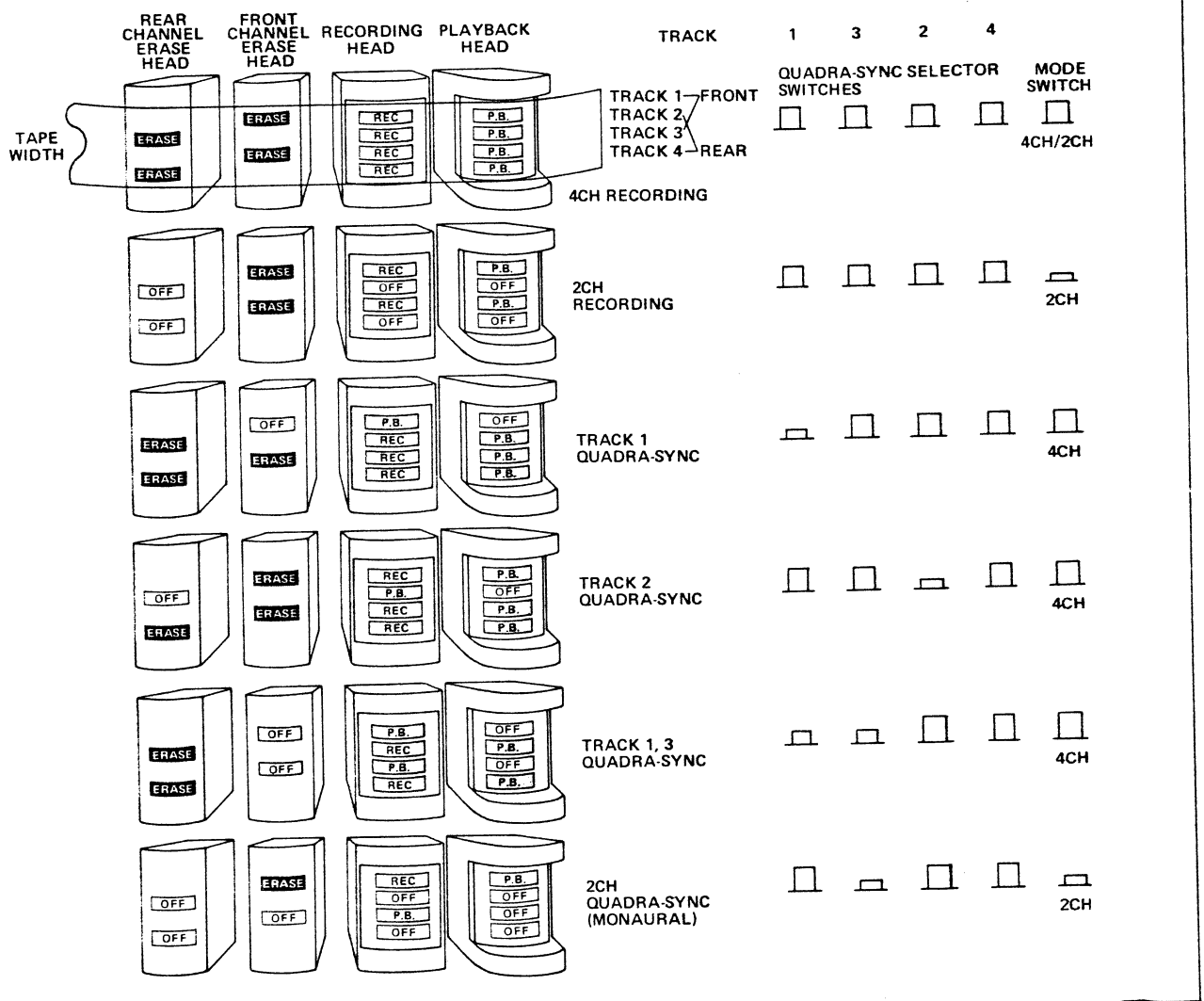
(time gap between recording and playback head)

AKAI'S QUADRA-SYNC SYSTEM



(perfect synchronization)

As shown in the figure at left, on conventional units, the sound monitored through headphones comes from the playback head. Therefore, eventhough there were several kinds of multiple recording systems, because of the short time necessary for the tape to travel from the recording to the playback head, sound synchronization was impossible. However, Akai's new Quadra-Sync system has completely eliminated this problem. With this new and unique system, the sound monitored is produced from the recording head (recording head tracks are switched to playback mode at will by means of the Quadra-Sync Track Selector Switches). Further, the operation of the playback and erase heads are also controlled with these switches as shown in the figures below.



Thus, Quadra-Sync recording methods are as unlimited as the imagination of the operator. The operation described below is a typical example.

1. Load a blank tape.
2. Connect power cord and turn on Power Switch.
3. Set Reel Size Selector according to size of reel being used.
4. Set Mode Selector Switch to 4-CH position.
5. Select tape speed with Tape Speed Selector Switch.
6. Set Index Counter to "0000".
7. Plug in microphone to Track 1 Microphone Jack (Mic Input Level Control should be at minimum before connecting microphone).
8. Set Monitor Switch to SOURCE position and connect headphones to Front channel Headphone Jack.
9. Depress REC and PLAY ► Buttons simultaneously to begin recording on Track 1. (It is usual to record rythmn first).
10. Adjust Track 1 Microphone Input Level Control while monitoring through headphones.
11. At end of recording, rewind tape to starting point.
12. Connect microphone to Track 3 Microphone Jack, and depress Track 1 Quadra-Sync Selector Switch.
13. Record on Track 3 in the same way as the first recording while monitoring Track 1 through headphones.
14. At end of recording, again rewind tape to starting point.
15. Connect Microphone to Track 2 Microphone Jack, depress Tracks 1 and 3 Quadra-Sync Selector Switches, and continue as in the first and second recordings until all tracks have been recorded.

* Each recording will have been completely synchronized with the original recording on Track 1, and therefore with each other.
* For stereo Quadra-Sync recording, set machine to 4-CH mode and synchronize Tracks 1 and 3 with Tracks 2 and 4 or vice versa while monitoring front or rear channel through headphones.
* During 4-CH Quadra-Sync mode, Tracks 1 and 3 or Tracks 2 and 4 can be monitored simultaneously by depressing both Quadra-Sync Selector Switches.
* Any track can be emphasized or de-emphasized at will by input level adjustment during recording. In case of front/rear channel stereo synchronization, this can also be accomplished by separate adjustment of Front and Rear channel Output Level Controls at playback time.
* Quadra-Sync Selector Switches and Mode Selector Switch should not be switched during recording or playback. This will cause the heads to become magnetized and noise to occur.
* It is normal for the frequency response level to decrease when using the recording head for playback.
* The Quadra-Sync Selector Switches must be kept at OFF (out) position except during Quadra-Sync recording.
* For playback of Quadra-Sync recording, set machine to normal 4-CH or 2-CH playback mode according to recorded tracks. (Do not operate Quadra-Sync Selector Switches.)

Caution: When making a Quadra-Sync recording, keep in mind that the Tracks on which the Quadra-Sync Selector Switches are not depressed will be erased.

ABSENTEE RECORDING

By using an external timer together with Akai Remote Control Unit RC-17, absentee recording can be accomplished with this machine. Connect Remote Control Unit to Remote Control Jack and properly load a tape, avoiding tape slack. Plug in AC Cord through the external timer. Adjust input level following recording procedure and with the Power Switch turned ON and the Remote Control Unit REC and FWD Play Keys locked into recording mode positions, set timer, following manufacturers instructions. If timer is set to coincide with source timing, the GX-630D-SS will automatically begin recording according to setting.

* This machine features Automatic Stop which is effected at the end of the tape.

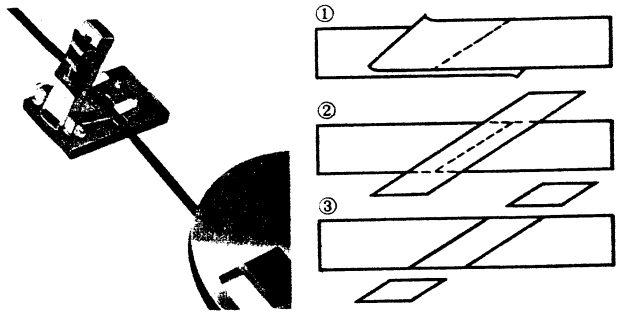
SOUND MIXING

Independent line and microphone jacks and input level controls enable signals from microphone and line sources to be mixed and recorded simultaneously on the tape.
For sound mixing, connect microphones to Microphone Jacks and connect desired source to the Line Input Jacks and follow 4-CH or 2-CH recording procedure.

TAPE ERASING

Any signals previously recorded on the tape will be automatically erased as a new recording is made. For erasing only, thread tape and set machine to recording mode. No plugs should be connected to the input jacks and the input level controls should be kept at minimum. For quick and complete erasure, a bulk tape eraser is recommended.

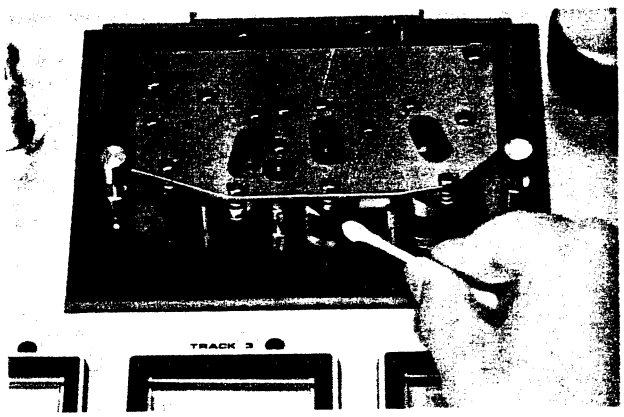
* Be sure to set the Mode Selector Switch to 4-CH or 2-CH as required.



TAPE SPLICING AND EDITING

Cut the tape diagonally with an overlap so that the ends are lined up. Cutting tape on the diagonal eliminates detection of the splice in recording. Cover aligned ends with splicing tape, exerting pressure to secure ends evenly. Trim off excess splicing tape. Cutting into the tape very slightly will eliminate the possibility of a sticky splice. Splicing using scissors requires skillful work. For smooth and easy splicing, Akai Tape Splicer AS-3 is highly recommended.

MAINTENANCE



HEAD BLOCK CLEANING

Heads

The GX (glass and crystal) Heads do not require a great deal of cleaning. However, if old tapes or tapes which have been spliced are used, GX head cleaning is also recommended. Clean recording, playback, and erase heads with a cotton swab stick which has been dipped in Akai Cleaning fluid from Head Cleaning Kit HC-500.

Pinch wheel and capstan

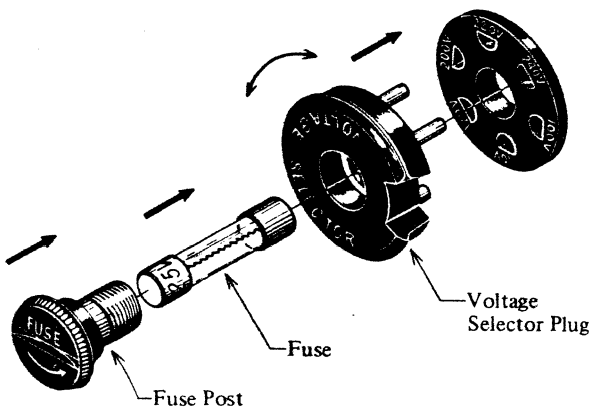
If foreign matter is allowed to accumulate on the pinch wheel and capstan, these particles will come off on the tape causing deterioration of sound quality. Oil adhering to the capstan also causes irregularity in tape transport. Therefore, it is also recommended that these parts be wiped clean periodically. Use Akai cleaning fluid or alcohol.

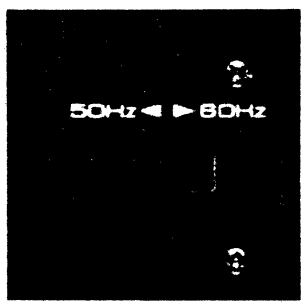
* Do not use chemicals such as chlorothane, etc. for head block cleaning as the rubber parts will deteriorate.

HEAD DEMAGNETIZING

Prolonged use of the machine will gradually build up residual magnetism on the heads. The effect of magnetization is that it causes a considerable drop in high frequency response and introduces noise into your recordings. It is therefore, recommended that head demagnetizing be performed periodically. This can be accomplished with a bulk head demagnetizer by bringing the prongs of the demagnetizer close to the heads and making several small circular motions over all head surface areas as well as the head housing.

* Turn off the power of the unit prior to demagnetizing the heads.
* Do not use magnetized tools in the vicinity of the heads and VU Meters.
* Do not bring the magnetizer close to the VU Meters.





VOLTAGE AND CYCLE CONVERSION (CEE, CSA, UL and LA models are not equipped with voltage and cycle change apparatus).

VOLTAGE

Your machine is equipped with a universal voltage selector offering a selection of voltage from 100V to 240V A.C. Voltage is preset at the factory according to destination. However, the operator is requested to reconfirm setting and, if necessary, readjust as follows:

1. DISCONNECT POWER CORD and remove the Fuse Post by screwing in direction of arrow.
2. Remove the Voltage Selector Plug and reinsert so that proper area voltage shows through the plug cut-out.
3. Change fuse to correspond with voltage and tighten fuse post. (Refer to standard accessory spare fuse tag instructions for proper fuse).

To maintain optimum performance and prolong the life of your machine, it is important that the line voltage be held within 10% of standard area voltage.

CYCLE

Correct tape speed cannot be obtained if the Cycle Change Switch located on the rear panel is not properly set. Set to 50 Hz or 60 Hz position according to area power source.

TECHNICAL DATA

Track System	4 track 4/2 channel compatible stereo system.
Reel Capacity	Up to 10-1/2" reel.
Tape Speed	7-1/2 and 3-3/4 ips. (±0.7%)
Pitch Control	±5%
Wow and Flutter	Less than 0.06% RMS at 7-1/2 ips. Less than 0.09% RMS at 3-3/4 ips.
Frequency Response	30 to 21,000 Hz ±3 dB at 7-1/2 ips. 30 to 15,000 Hz ±3 dB at 3-3/4 ips.
Distortion	Less than 0.5% at 7-1/2 ips. (1,000 Hz "0" VU)
Signal to Noise Ratio	Better than 54 dB (measured via tape with peak recording level of +6 VU).
Erase Ratio	Better than 70 dB.
Bias Frequency	100 k Hz.
Heads	(4): One 4 TR, 2-CH/4-CH GX playback head. One 4 TR, 2-CH/4-CH GX recording head. One Front CH erase head. One Rear CH erase head.
Motors	(3): One AC Servo motor for capstan drive, two eddy current motors for reel drive.
Fast Forward and Rewind Time	120 sec. using 2,400 ft tape.
Output Jacks	Line (2): 0.775 V (0 VU) Required load impedance: More than 20 k ohms. Phone (1): 30 mV/8 ohms.
Input Jacks	Microphone (2): 0.25 mV/10 k ohms. Line (2): 70 mV/150 k ohms.
Semi-conductors	Transistors 65, Diodes 63, ICs 4.
Power Requirements and Power Consumption	U.S.A. and Canada Models: 120 V, 60 Hz only. 90 W. CEE Models: 220 V, 50Hz only. 100 W. BSI Models: 240 V, 50 Hz only. 100 W. Other Models: 100 to 240 V, 50/60 Hz. 90 W. (Switchable)
Dimensions	440 (W) x 527(H) x 240(D) mm (17.3 x 20.7 x 9.4")
Weight	20.7 kg (45.5 lbs)

* Specifications determined with Scoth #211 tape.
* For improvement purposes, specifications and design are subject to change without notice.
* "Surround Stereo" used with permission of Vangard Records.

STANDARD ACCESSORIES

Pin Plug Connection Cords	2
10 1/2" Reel Adapters	1 set
10 1/2" Enpty Reel	1
Spare Fuses	1 set
Operator's Manual	1

* Spare Fuses not included with CEE, CSA, BSI, UL and LA models.

TROUBLE SHOOTING CHART

The conditions listed below do not indicate mechanical failure of your unit. If your machine exhibits any of these conditions, check for trouble as indicated.

SYMPTOM	TROUBLE	REMEDY
Loss of sensitivity and tone quality.	* Dirty Heads.	* See HEAD BLOCK CLEANING.
	* Wrong side of tape facing the heads.	
	* A.C. power lower than the voltage to which your machine is adjusted.	
	* Magnetized head.	* See HEAD DEMAGNETIZING.
	* Tape Selector Switch is set incorrectly.	
Machine will not record or playback.	* Check positions of controls and input/output.	
	* Check position of the Automatic Stop/Tape Tension lever.	
	* Output Level Control at minimum.	
Irregularity in tape transport.	* Oil or magnetic particles adhering to the Capstan or Pinch Wheel.	* See HEAD BLOCK CLEANING.
	* Sticky or dirty tape surface.	
	* Improperly loaded tape.	* See TAPE LOADING.
	* A.C. power lower than the voltage to which your machine is adjusted.	
Tape will not run.	* Blown fuse.	
	* Power is not being supplied.	* Check power cord, Power Switch, and Automatic Stop/Tape Tension Lever.
	* Twisted or sticky tape.	
Previously recorded program will not erase.	* Erase head is dirty.	* See HEAD BLOCK CLEANING.
Distorted or noisy sound.	* Recording level is too high.	* Normal recording level is zero VU.
	* Check external source controls and connections.	